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THE GOLD-PLACER DEPOSITS OF THE STOKE MOUNTAINS, EASTERN TOWNSHIPS OF QUEBEC

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THE GOLD-PLACER DEPOSITS OF THE STOKE MOUNTAINS, EASTERN TOWNSHIPS OF QUEBEC.

By

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PUBLIC

Introduction:-

The presence of placer gold in the gravels of the streams draining eastward from the Stoke Mountains in the Eastern Townships, has been known for almost a hundred years. Whether or not this gold occurs to an extent and in a value sufficient to warrant anything but the desultory operations that have taken place has never been seriously investigated. The writer believes that these streams warrant a closer investigation. He warns, however, that this investigation, to be thorough and satisfactory, probably would be expensive - the cost of testing and exploration here probably would be of the same order as that experienced in proving a hard-rock prospect. Consequently it should not be attempted except by those who are prepared and able to risk such a considerable sum of money.

Location:-

The Stoke Mountains rise to a height of 2,125 feet above sea-level at Mount Chapman (Bald peak). They begin some seven miles north-east of Sherbrooke and follow a northeasterly course for eleven miles, or to about the latitude of Dudswell pond. The chain is included within the Townships of Dudwell, Stoke, and Westbury, corner townships that belong respectively to the counties of Wolfe, Richmond, and Compton. The higher hills are in Stoke township and in the extreme

north of Dudswell. The hills slope rather abruptly down to the general elevation of the region, 800 feet, on the western side, while on the eastern side there is a more gentle slope to an altitude of 700 feet.

Bedrock Geology:-

The Stoke hills are composed of igneous rocks, both plutonic and volcanic, long since determined and mapped as Precambrian in age (1). While the evidence is not positive that the rocks are Precambrian in age they are certainly older than the surrounding sedimentary rocks. The latter are mainly Ordovician, with some infolded Devonian and perhaps some Silurian.

The rocks noted by the writer in a reconnaissance study (2) of the geology of the Stoke hills are as follows:- granites, sericite, (quartz porphyry) schists, quartz porphyry (rhyolite porphyry), and agglomerate or conglomerate.

Granites are most continuously shown in the eastern part of the Stoke hills, occupying a belt up to a mile and a half wide. They occur in several varieties, including particularly a light-colored type in which quartz and feldspar are the only minerals that show in hand specimen. Also common is a darker type consisting also largely of quartz and feldspar but with occasional or scattered phenocrysts of quartz up to two inches diameter. Hornblende granite, hornblende-biotite granite, and hornblende syenite are much rarer types.

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(1) Ells, R.W., Report on the Geology of a Portion of the Eastern Twps. Geol. Surv. Canada, Ann. Rep., Pt. D, 1887, pp. 31-32.

(2) 1935, in connection with the review of the placer areas.

The sericite or quartz porphyry schists are light-coloured, sericitic, [redacted] schists with quartz, and sometimes feldspar, phenocrysts. There is some evidence that these schists resulted from metamorphism of some of the granites, and perhaps also of rhyolite porphyry. They are not an important rock type in the Stoke hills proper.

The rhyolite porphyries are the most widespread rocks in the Stoke series. They outcrop continuously from the north end of the igneous area southward through or along the Stoke ridge, forming the high part of the hills towards their western side, and they continue southward in intermittent exposure almost to the St. Francis river near Sherbrooke. The rock is light-coloured, light-gray weathering, and contains phenocrysts and amygdules of quartz and less abundant feldspar in a ground mass that varies from very fine-grained to glassy. Rounded, scattered phenocrysts of quartz up to an inch in diameter occur.

Agglomerate or Conglomerate forms the western edge of the igneous complex of the Stoke hills, and lies on the outer or western edge of the rhyolite porphyry. Generally stated, the formation is characterized by rounded inclusions (or boulders and pebbles) of acid granite and rhyolite porphyry. The inclusions are well-rounded and have the appearance of water-worn boulders and pebbles. They vary in size up to two and a half feet by one and a half feet. The matrix, in places at least, appears definitely ingeous and is describable as amygdaloidal and porphyritic rhyolite and andesite, with feldspar the common mineral showing. This formation appears to grade into the rhyolite porphyry and to overlie the porphyry. It is in turn overlain by the later sedimentaries that border the Stoke series on the west.

Probable Local Origin of the Placer Gold.

The rocks reviewed above are evidence of an igneous history during which primary deposits of gold could have formed. No one of these need have been of large extent or individually valuable under present standards, but, all told, they may well have been the source of the gold in the Stoke streams. It is not unusual to have placer ground in a region lacking in paying "lode" deposits.

The igneous rocks of the Stoke hills are cut in many places by quartz veins. Generally these veins are of white quartz, practically barren of other minerals, but at some places pronounced, metallic mineralization has developed. Assays of many of these veins showed traces only of gold, and but one yielded distinctive values. The vein is in lot 14, Range VI, of westbury, about half a mile east of Willard brook and the same distance northwest of the Sherbrooke highway. Both Chalmers (1) and Obalski (2) have recorded the presence of visible gold here, and Chalmers reports and assay of 0.35 oz. of gold to the ton, or $6.40 at the price of that time. Later a mill test gave $1.62 of gold to the ton, while assays of selected samples gave values from $4.00 to nothing to the ton. This prospect probably has no economic future but it is of interest as an example of the type of vein that may have yielded its gold to form the placers of the Stoke stream. As more directly indicating local sources for the placer gold both Chalmers (1) and Obalski (2) report finding pieces of quartz and of

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(1) Chalmers, R.W., Report on the Surface Geology and Auriferous Deposits, of South-Eastern Quebec. Geol. Surv. Canada, Ann. Rep., Vol. X, Pt. 5, 1897.

(2) Obalski, J., Gold in the Province of Quebec. Dept. of Colonization and Mines 1898.

"conglomerate" showing visible gold in the gravels of several of the Stoke streams.

Finally, so far as is known to the writer, the gold-bearing streams of the Stoke mountains are confined to the southeastern side. And, while very little of the Stoke drainage goes to the west or northwest, the coincidence between the lack of reported gold and the fact that this westward drainage barely taps the igneous areas is somewhat significant.

The Effect of Glaciation:-

The fact that this region was glaciated, and possibly heavily glaciated, is considered by some as a priori evidence and reason for disregarding any placer gold occurrences from this region reported to them. It is felt, by this reasoning, that glacial action must have destroyed any original placer deposits that may have been present, and that any placer gold now occurring must be washing out of glacial drift and hence could not be of economic extent. Such reasoning disregards evidence that has been accruing since at least 1866. In that year Logan (1) concluded that "the original gold-bearing drift was of considerable antiquity" and underlay the glacial boulder clay. MacKay (2), in 1921, showed that pre-glacial deposits carrying placer gold occurred in the Chaudière region, and the present writer (3), in 1934, came to the same conclusion for the Ditton area. In the Stoke area no conclusive evidence of pre-glacial deposits was secured,

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(1) Logan, W.E., Gold. Geol. Surv. Canada, Rp. Prog. 1863-66, pp. 7-8

(2) MacKay, B.R., Beauceville Map-Area, Quebec. Geol. Surv. Canada, Mem. 127, .921.

(3) McGerrigle, H.W., Mount Megantic Area, Southeastern Quebec, Que. Bur. Mines, Ann. Rep. Pt. D, 1934.

although their presence was suggested, as also the presence of pre-glacial channels for some of the streams.

The occurrence of pre-glacial unconsolidated deposits in a glaciated region is not unique. Gold placers of pre-glacial age occur in the Creek Valleys of the Cariboo district in British Columbia (1). Also there are the lignites (2) of Brandon, Vermont, dated by plant fossils as Miocene in age, and the Lower Cretaceous clays (3) occurring on four rivers of the James Bay slope. Evidently the scouring action of the ice was not as complete in some regions, and in some parts of regions, as in others.

The Big Hollow, Willard, and Kingsley Brooks.

Naturally no amount of arguing will make the placer gold of the Stoke streams into a paying proposition unless the gold is there in amounts that can be taken out economically. And this is just what has never been determined and what the writer feels should be investigated by a competent placer engineer.

The Stoke streams that have attracted attention as possible placer ground are as follows, from northeast to southwest: the Hall,

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(1) Johnston, W.A., and Uglow, W.L., Placer and Vein Gold Deposits of Barkerville, Cariboo District, British Columbia. Geol. Surv. Canada, Mem. 149, 1926.

(2) Knowlton, F.H., Notes on the Fossil Fruits and Lignites of Brandon, Vermont. Bull. Torrey Bot. Club, No.29, Nov. 1902, pp.635-641.

(3) Dyer, W.S. and Crozier, A.R., Refractory clays of Northern Ontario. Can. Inst. Min. and Met. Trans., Vol.36, 1933, pp.238-252

Rowe, Andrews, Kingsley, Willard, Big Hollow, Little Big Hollow, Mills, and Ryther brooks. All of these have been discussed in the writer's report of 1935, and only the Willard, Big Hollow, and Kingsley brooks will be reviewed here, inasmuch as they have attracted most recent attention. The following accounts are taken mainly from the 1935 report (1)

The Big Hollow is one of the largest of the Stoke streams. This brook parallels the Willard at a distance of about one mile and the two occupy approximately a middle position in the Stoke drainage. The upper limit of placer possibilities on this brook would seem to be at the forks, about three miles above the Gosford road. The fall in this distance is 500 feet, or about one foot in 31 feet. Between the road and the St. Francis, in a distance of one-half mile the fall is about 125 feet, or about one foot in 21 feet. From the St. Francis upstream for approximately one mile the valley flat is upwards of 500 feet wide. Bedrock shows only in the upper 500 feet of this distance. Upstream, the flat gradually narrows, but is seldom less than 100 feet wide until the Stoke hills are reached.

All of the reported work on this stream was done in lot 11 of Range V, Westbury. The first work was done about 1882 by Wm. Trenholme, of Montreal, "who got out about $75.00, a shaft about 25 feet deep having been sunk". In 1897 Mathieu and Thibaudeau "got a little gold" in the brook. "They then sank two shafts of 24 and 27 feet which struck the bedrock; in the 27 feet shaft they found a little gold". Another shaft was put down by these men to a depth of 50 feet without

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(1) McGerrigle, H.W., Gold Placer Deposits of the Eastern Townships. Que. Bur. Mines, Ann. Rep., Part E, 1935.

getting values. Their work in 1897-1898 yielded about $100 worth of gold, apparently derived mainly from the bed of the brook, and including one 19 dwt nugget. The Dominion Mining Company, and then C.A. Parsons of Boston, did some exploratory work on the Big Hollow between 1902 and 1905.

Apparently little work was done on this brook between 1905 and 1939. In 1939-1940 J.W. Stevenson and W. Davis, of East Angus, did some trenching and sluicing in lot 11, Range V, Westbury, getting out some gold, the amount being unreported to the Quebec Bureau.

Big Hollow brook apparently has been much prospected, and some gold has been taken out. However, it can not be said that its possibilities as placer ground have been explored. It would seem that there is here a deeply buried pre-glacial channel, the bottom of which probably was not reached by any of the four or five prospect shafts that had been sunk. Gold occurs along the present stream bed from the St. Francis river at least to the forks. The upper part of the valley, and even through the part that has been most prospected, is rather heavily encumbered with large boulders. The lower part of the valley, opening into flats, is floored by sediments which probably could be handled by a dredge. It seems to the writer that the possible pre-glacial channel as well as the lower flats offer possibilities that should be tested. The thickness of the deposits, and the trouble given by water in shaft-sinking, indicate that the best method of determining the value of the deposits would be by drilling. The drilling program would necessarily need to be under competent and expert supervision if results of any significance are to be obtained.

The Willard brook and the Big Hollow are comparable in size. From its head near Mount Chapman it falls 500 feet in the first mile and one-third of its course. Then it flows quietly for three-quarters of a mile through a swamp where the total fall is 25 feet. In the remaining distance of about two miles to the Sherbrooke highway the fall is 400 feet, or about one foot in 25 feet.

Going upstream from the highway, the first bedrock observed was at about 2,500 feet, that is, at the reservoir dam. In this distance the valley flat averages 250 feet in width. Upstream for 1,000 feet above the reservoir the flat averages about 150 feet wide, and beyond this narrows somewhat rapidly to 100 feet and less.

No detailed information is available of the work done on this stream. The earliest work seems to have been that of Fred Harrison, in 1895. Obalski reports that about $200 worth of gold was taken out by Harrison. His workings are about 1000 feet above the reservoir dam, on a low terrace 75 feet wide and 275 feet long on the west side of the brook. Two trenches were dug in this terrace by Harrison, while a third and upper trench was dug at a much later date. Harrison's trenches were dug to the granite bedrock, which was reached at a maximum depth of seven feet. Evidence of a buried, and probably pre-glacial, channel about underneath the present course of the stream was obtained here by the writer in 1935.

Obalski reports that some prospecting was done by Henry Hughey in 1898 on lot 28 range XII, Stoke, about a mile above Harrison's workings. The mining operations report for 1898 states that Hughey got out a "small quantity" of gold.

Colours of gold were found by the writer at intervals from

the stream gravels of this brook between the highway and the forks, and also for about 2,000 feet along the branch leading toward Mount Chapman.

While the quantity of gold taken from the Willard brook is small, the possibilities of the stream as placer ground have not yet been well tested. The prospecting that has been done has been limited to shallow depths and there has been no attempt to follow out the probable pre-glacial channel that has been suggested as occurring near the Harrison workings. Nor have the flats in the lower part of the brook received consideration. It would seem that this brook merits prospecting from at least the highway up stream for a mile or more. As in the case of the Big Hollow, the overburden on Willard brook is generally so thick that satisfactory tests would necessitate boring.

The Kingsley brook is the smallest of the Stoke streams listed above. It lies next to the northeast of Willard brook. The physical conditions on this brook will be found in the 1935 report, as well as an account of operations and of the amount of gold taken out. The writer wishes merely to repeat here the general conclusions arrived at earlier. "Firstly, the original value of the ground is attested by the reports of both Chalmers and Obalski. The wirter has panned a little gold.... and has seen two or three nuggets worth 50 cents taken out; always from bedrock cracks and in ground that had been worked over by the early miners. Secondly, the gold rested in a place not at first sight favourable to its retention, remaining on the floor of a narrow, gorge-like valley above a fall..... Finally, there is the evident possibility that much more gold was carried over the fall and into the basin or gorge below than remained behind. Deep testing is necessary

to ascertain whether the gold has remained there, and boring appears the only feasible method of attacking the problem" (p.49).

In 1938 the East Angus Placer Mining Society, Reg'd, was formed, and received a special license to work on the Stoke streams. The license was granted for five years dating from September 8, 1938. Mr. A.R. Rousseau of East Angus was president. The special license was revoked September 9, 1939. Since that time Mrs. J.A. Frasier, of Cookshire, has received a special license applying mainly to the Big Hollow and Willard streams.

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